

Experience learned by using the IPCC's Good Practice Guidance on Land Use, Land-Use Change and Forestry in developing Japan's GHG inventories

SATO Atsushi

Greenhouse Gas Inventory Office of JAPAN
(Mitsubishi UFJ Research & Consulting)

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Outline

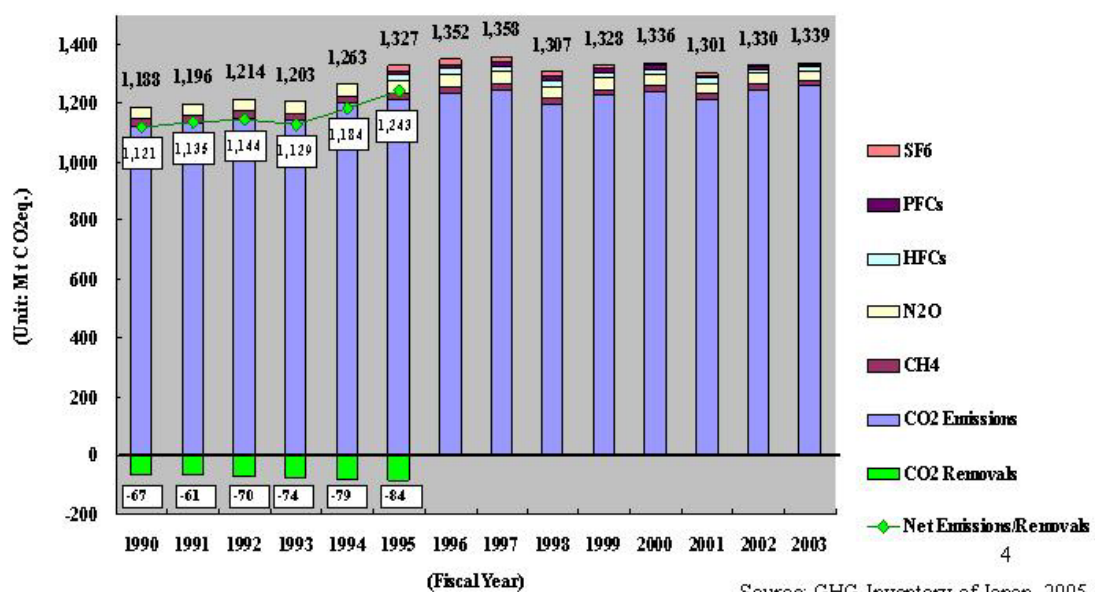
1. Overview of Japan's GHG Inventory
2. Overview of LULUCF Sector
3. Comparison between **LULUCF** Inventory
and **LUCF** Inventory
4. **LULUCF** Inventory Preparation

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1. Overview of Japan's GHG Inventory

GHG emissions and removals in Japan

- GHG emissions from source : 1,327 Mt CO₂eq. in 1995
- CO₂ removals into sink : 84 Mt CO₂ in 1995



Source: GHG Inventory of Japan, 2005

Japan's GHG inventory

- Developed and submitted to UNFCCC every year since 1996
- Using CRF (Common Reporting Format) and Excel based calculation files
- Have been preparing NIR since 2003
- Will use CRF reporter for submitting to UNFCCC from 2006

Japan has been developing national inventory system to satisfy the UNFCCC and Kyoto Protocol requirements ⁵

Japan's inventory preparation system

- The Ministry of Environment (MOE) is the national entity responsible for national inventory.
- GIO and some private-sector consulting firms work together with MOE for inventory preparation.
- Other Ministries are involved in the inventory preparation system by providing data, confirming data from technical view point and so on.
- External experts review calculation methods, EF, activity data, and an entire inventory and provide advice.

2. Overview of LULUCF Sector

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GHG emissions and removals of LULUCF sector in Japan

Table1: Emissions & Removals of LULUCF sector in 1995

Land Use Categories		GgCO ₂ eq		
		CO ₂	CH ₄	N ₂ O
5A. Forest Land	-93,149			
1. Forest Land remaining Forest Land		-91,637	22.45	2.28
2. Land converted to Forest Land		-1,537	IE	IE
5B. Cropland	2,298			
1. Cropland remaining Cropland		0	0.00	0.00
2. Land converted to Cropland		2,085	6.17	207.26
5C. Grassland	1,636			
1. Grassland remaining Grassland		0	NE	NE
2. Land converted to Grassland		1,635	0.93	0.09
5D. Wetlands	231			
1. Wetlands remaining Wetlands		NO,NE	NE	NE
2. Land converted to Wetlands		225	5.52	0.56
5E. Settlements	4,548			
1. Settlements remaining Settlements		-332	NE	NE
2. Land converted to Settlements		4,759	109.29	11.09
5F. Other Land	1,127			
1. Other Land remaining Other Land			NE	NE
2. Land converted to Other Land		1,114	11.82	1.20
Total Land-Use Categories	-83,309	-83,688	156	222

(+) emission, (-) removal

Source: LULUCF CRF of Japan, 2005⁸

Feature of land use in Japan

- Area of forest cover is large
 - two-third of national land
 - this ratio has not been changed for the last 100 years.
- Most of agricultural land use is arable and tillage.
 - grassland is not significant in Japan
- The ratio of settlements have been increasing.
 - urban greening also have been performed

Table: Area of Land Use in Japan

Land Use Category		1990	1995	2003
Forest	[10 ⁴ ha]	2,524	2,514	2,509
Agricultural land use	[10 ⁴ ha]	534	513	482
Wilderness	[10 ⁴ ha]	27	26	26
Water surface and river	[10 ⁴ ha]	132	132	134
Road and Residential land	[10 ⁴ ha]	275	291	313
Other land use	[10 ⁴ ha]	285	303	316
Total	[10 ⁴ ha]	3,777	3,779	3,780

Source: Land White Book, MLIT Japan, 2005

Japan's LULUCF (LUCF) Inventory

- Developed LUCF Inventory based on 1996GL and used it until 2004 submission.
- Revised based on LULUCF-GPG in 2005 (LULUCF Inventory).
- Development and revision of LULUCF Inventory is ongoing.
- Inventory for Kyoto Protocol article 3.3 and 3.4 is under development as well.

LULUCF inventory preparation system

- MOE is the responsible agency and coordinator.
- Forest Agency (FA), Ministry of Agriculture Forestry and Fisheries (MAFF) and Ministry of Land Infrastructure and Transport (MLIT) also play important role for LULUCF inventory preparation from technical viewpoints.
- Expert review is conducted as appropriate for improving LULUCF inventory quality.

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3. Comparison between LULUCF Inventory and LUCF Inventory of Japan

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Main Changes on LULUCF-GPG from IPCC1996GL-LUCF

- Reclassification of calculation categories
 - Land based categorization
 - All national land and the entire land use change between categories are covered
 - Land use information in the past (ex.20years) is required
- Clarification of five carbon pools for calculation
 - Above-ground Biomass, Below-ground Biomass, Dead wood, Litter, Soil Organic Matter
 - Reporting will be conducted under three categories (Living Biomass, Dead Organic Matter, Soil)
- Annex (necessary information) and Appendix (extra information)

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LUCF Inventory of Japan until 2004

The Categories Japan reported under LUCF-CRF based on 1996GL

LUCF Category		Status	LULUCF Inventory
5A	2.Temperate Forests	○	→5A1
	5.Other (Park and Green space conservation zone)	○	→5E1
5B	2.Temperate Forests conversion	○	→5B2, 5C2, 5D2, 5E2, 5F2
	4.Grassland conversion	NE	Newly estimated
5C	2.Abandonment of managed temperate forests	NE	-
	4.Abandonment of managed grassland	NE	-
5D	CO ₂ emissions and removals from Soil	NE	Newly estimated

※ Other Categories are reported as NO

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Source: GHG Inventory of Japan, 2005

LULUCF Inventory of Japan in 2005

Status of reporting in Japan's LULUCF-CRF based on LULUCF-GPG

From \ To	Forest	Cropland	Grassland	Wetlands	Settlements	Other land
Forest	○	○	○	○	○	○
Cropland	○	○	○	○	○	○
Grassland	○	○	○	○	○	○
Wetlands	○	○	○	○	○	IE
Settlements	○	○	○	○	○	IE
Other land	○	○	○	IE	IE	○
5(I)	5(II)		5(III)		5(IV)	5(V)
IE	NO (Organic Soil) NE (Mineral Soil)		○ (Organic Soil) NO (Mineral Soil)		NE	○(controlled fire) NE (wild fire)

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Source: Revised GHG Inventory of Japan, 2005

Status of 2005 Japan's LULUCF inventory compared to the previous LUCF inventory

Carbon pool	Status of LULUCF inventory compared to LUCF inventory
Living Biomass	<ul style="list-style-type: none"> • Some methodologies are used for forest removals and emissions. • Carbon loss from forest disturbance and forest fire are newly estimated. • Emissions from land use change concerning non forest lands are newly estimated.
Dead Organic Matter	<ul style="list-style-type: none"> • Dead Organic Matters are reported as NE.
Soil	<ul style="list-style-type: none"> • Emissions and removals from carbon stock changes caused by land use changes are newly estimated under "conversion" categories. • Using Tier.1 (no change) for "remaining" categories.
Non CO ₂ Gas	<ul style="list-style-type: none"> • Non CO₂ gas emissions from "disturbance associated with land-use conversion to cropland" and "biomass burning" are newly estimated.

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General information on transformation from LUCF to LULUCF inventory

- **Estimation**
 - New estimations will be required generally.
- **Data**
 - More data are necessary to complete LULUCF Inventory.
- **Complexity**
 - Category classification becomes complex.
- **Consistency**
 - Much more attention is necessary for land classification consistency and time series consistency

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4. LULUCF Inventory preparation

Profile of Japan's LULUCF Inventory

- **Statistics-based land classification system**
 - Area of lands and land use changes is derived from several statistics.
- **Excel-based calculation system**
 - Special skills are not really required for inventory compiler.
- **Many parameters are country specific**
 - Improvement for parameter usage and data collection is ongoing.

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Difficulties we faced in 2005

- Consistent Land use category setting and appropriate estimation methods of land use change
 - “Remaining” and “Conversion” classification.
 - How do we know the information on land use and land use change in the last 20 years?
- The method and improvement planning is under discussion.
- Lack of country specific parameters
- Relevant research has been performed
- Appropriate estimation and interpolation methods.
- Inspection and improvement has been conducted

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Potential advantages and disadvantages of two land classification methodologies

	Statistical Base (Approach1,2)	GIS Base (Approach3)
Advantage	<ul style="list-style-type: none"> • Existing forest inventory, land statistics or agricultural census can be used. • Consistent to agriculture sector. • Periodic updating is relatively easy. • Categorization is easy if single statistic is used for preparation. 	<ul style="list-style-type: none"> • Existing GIS data can be used if available • Consistent land categorization can be performed
disadvantage	<ul style="list-style-type: none"> • Consistent land categorization may be hard work if several data are used together. 	<ul style="list-style-type: none"> • Georeference is essential • Periodic updating might involve high cost and work.

What should be considered for LULUCF Inventory Preparation

- Analysis of data acquisition and applicability are necessary.
- The objective and precision level should be clarified.
- Cooperative framework between inventory compiler and the data providers, experts and so on may be important.